Academy of Math, Science, and Technology Bridger Middle School
Robotic Arm – Reduced Gravity Flight Final Report

Goal/ Purpose of Investigation

Our school offers robotics as both a class and after-school program. Our students designed a robotic arm to be used in our reduced gravity flight experiment and in a SCUBA reduced gravity experiment in our swimming pool. The students wanted to know if the robotic arm could lift a ten pound weight and what would be required to stabilize the robotic arm.

Investigation Results/Data

The design of the robotic arm was such that it was able to lift the ten pound weight during the reduced gravity flight. The robotic arm was tied down during flight, which helped to stabilize it during flight. We decided to mark the various parts of the robotic arm so that it is not extended beyond its stabilization points. We originally hoped to test the robotic arm in our SCUBA reduced gravity experiment; however, the design and weight of the arm itself makes this impossible.

Investigation Conclusion

The robotic arm was able to lift the ten pound weight. The students were creative and thought "outside the box" to design a real-world product.

Lessons Learned From the Experience

1. The VITS enabled the students to be involved in the whole process.
2. Both teachers returned excited and followed-up with their classes as well as other classes with much enthusiasm.
3. Students were exposed to various careers within NASA and the science field.

Outreach Events Performed/Planned

1. Nevada Family Magazine (April, 2006).
2. KLVX magnet school video – will be shown around the county.
3. Parent meetings.

Student Educational Outcomes of Participation in This Program

1. Students gained experience in thinking "outside the box" and learned about robotic design using computer graphics.
2. Students learned about careers in science and math.
3. Students learned there are more career opportunities in NASA than just astronauts.
4. Students had the opportunity to interact with NASA scientists through VITS.

What evidence will be collected to assess educational impact on the students?

Student surveys will be distributed after viewing the video and instruction.

Teacher or Community Outcomes of Participation in This Program:

Perry Lopez says “I broadened my teaching experience.” Tyrel Cooper said “Sometimes, we as teachers underestimate our students and what they can accomplish; but if we offer them the forum to perform at a high level. We will see what they are really capable of.”